Levels of anxiety and depression related to COVID-19 among physicians: An online cross-sectional study from Turkey

Determination of anxiety and depression levels related to COVID-19 infection

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Abstract

Aim: In this study, we aimed to determine anxiety and depression levels related to COVID-19 infection of assistant physicians who were taking medical specialty training in a medical faculty hospital.

Material and Methods: We performed this cross-sectional study in a medical faculty hospital located in Turkey's Eastern Anatolia region. The universe of the survey was composed of all assistant physicians (342 persons) who were taking medical specialty training in this hospital. We aimed to reach the entire universe without selecting a sample. Of the physicians, 264 have been accessed (responsiveness rate 77.2%). In combination with sociodemographic questions, State-Trait Anxiety Inventory Test (STAI) and the Beck Depression Inventory (BDI) were used. STAI measured state anxiety value, whereas BDI depression findings.

Results: Women accounted for 51.9% of the study participants and the mean age of those was 29.7 ± 3.5. Of the physicians, 81.1% thought that the COVID-19 infection influenced themselves spiritually and 84.1% of participants were afraid of getting an infection because of being a healthcare worker, while 98.5% of transmitting the infection to their relatives or environment. The anxiety and depression scores of women were determined to be significantly higher than the scores of men. We found a significant difference between anxiety and depression and regret about choosing a medical profession, thoughts of leaving the assistantship.

Discussion: Anxiety and depression levels of female physicians were significantly higher than male physicians. In our study, a large proportion of physicians (84.1%) were found to be afraid of getting infected with COVID-19 and transmitting the infection to any of their relatives (98.5%). In this study, no significant relationship was established between marital status and anxiety and depression levels.

Keywords

COVID-19; Depression; Anxiety; Physician

Introduction

The 2019 coronavirus outbreak affecting the whole world, together with the genetic structure of the virus, was first presented by Zhu et al. as a summary report on January 24, 2020. Since the researchers detected the virus first on January 13, 2019, its name later has changed as COVID-19. The epidemic was initially revealed in individuals who were located in the seafood and animal market in Wuhan, China. Then, by transmitting from human to human, it spread to other cities in the province of Hubei, especially Wuhan and other provinces of the People's Republic of China and other countries of the world. The spread of COVID-19 has become unstoppable, and, with the transmission of the virus to more than 100,000 people in 100 countries, COVID-19 has reached the epidemiological criteria required to declare it as a pandemic [1]. Therefore, COVID-19 disease was announced as a pandemic on March 12, 2020 [2].

As a result of the rapidly increasing numbers of confirmed cases and deaths, both medical staff and the public have been experiencing psychological problems, including anxiety, depression, and stress [3, 4]. Protection and support and ensuring the safety of HCWs, the creation of mechanisms to support HCWs spiritually, and providing the necessary tools for HCWs are one of the most important first steps in combating the epidemic [5].

Healthcare workers, especially physicians, play crucial roles in both the prevention and treatment of COVID-19 pandemics. The requirement of being in close contact with the patient and the status of witnessing every stage related to the pandemic process result in physicians to be involved in the risk group for anxiety and depression. Especially the increasing mortality rates, burdensome and stressful physician workloads, the risk of being infected, and of transmitting the infection to their own families cause anxiety and depression worldwide. Besides, those affect the physicians who are fighting at the forefront of this profession more. Therefore, it is essential to determine the status of anxiety and depression that physicians experienced during the process and to provide accordingly required supports. The present study aimed to determine anxiety and depression levels related to COVID-19 infection of assistant physicians who were taking medical specialty training in a medical faculty hospital.

Material and Methods

This cross-sectional study was conducted between March and April 2020 in Fırat University Medical Faculty Hospital of Elazığ province located in the Eastern Anatolia region of Turkey. Ethical approval with a number of 97132852/050.01.04 was obtained for the study from the Ethics Committee of Fırat University, Non-Interventional.

The universe of the study was composed of all assistant physicians (342 persons) who were taking medical specialty training at Fırat University Faculty of Medicine. Two hundred sixteen and 126 of those 342 are involved in the internal and surgical branch of medicine, respectively. We aimed to reach the entire universe without selecting a sample. Two hundred sixty-four physicians were accessed (responsiveness rate 77.2%). The reason for not being able to reach the entire universe was having a high workload of some physicians because of the COVID-19 pandemic.

The questionnaire prepared by the researchers was applied to the involved volunteer persons via a google form. The reason for using the online method for the survey is that the social isolation rule is applied due to the epidemic. Before starting the survey, the participants were informed that the information received would not be used outside the scientific platform of this study. Besides, necessary explanations were made about the survey and the questions of the questionnaire. In combination with sociodemographic questions, we applied the State-Trait Anxiety Inventory Test (STAI) and the Beck Depression Inventory (BDI) to all physicians. STAI measured state anxiety value, whereas BDI depression findings. The state anxiety inventory was developed by Spielberger et al. to measure anxiety levels in individuals (e.g. young, student, patient) aged equal to and over 14 years and normal adults [6]. The response options contained in four categories of the state anxiety scale were defined as (1) None, (2) Some, (3) A lot, and (4) Completely. There are ten reverse expressions in the state anxiety scale. These are 1, 2, 5, 8, 10, 11, 15, 16, 19 and 20 items. The scores derived from the scale theoretically range from 20 to 80. High score is expressed as high anxiety level, low score as low anxiety level. Those were adapted to Turkish by A. Le Compte and N. Öner [7].

Beck Depression Scale was developed by Beck et al. to measure physical, emotional, cognitive, and motivational symptoms in depression [8]. The scale objectively determines the degree of depression symptoms. There are four options in each of the twenty-one items, and each item is scored from 0-3 points. The score of depression is determined by summing these points. A significant correlation is present between high total scores and the severity of depression. Higher total scores indicate greater depressive symptoms. The validity and reliability study in our country was done by Hisli [9].

We used SPSS 22 (Statistical Package for the Social Sciences, version 22) statistical package program to analyze data. Descriptive values were indicated by the number, percentage, mean ± standard deviation, and median (Interquantel range). We performed a normality analysis of measurement data with the Kolmogorov-Smirnov test. For data not fitting the normal distribution, the Mann-Whitney U test was carried out to compare binary groups, the Kruskal-Wallis test to compare more than two groups. Multiple linear regression analysis was performed to identify factors associated with depression and anxiety, of which the variable selection strategy was Enter method. Gender, the negative influence on spiritual health, and regret were taken for regression analysis. The Spearman correlation analysis was performed to compare quantitative data with each other. We considered $p < 0.05$ statistically significant in all analyzes.

Results

A total of 264 physicians who were taking medical specialty training, involving 137 (51.9%) women and 127 (48.1%) men, were included in the study. The mean age of the physicians was 29.7 ± 3.5 years. One hundred thirty-four (50.8%) of the participants were married, and 201 (76.1%) were working in the internal branch of medicine. While 193 (73.1%) of the physicians were keeping sentry, the median of the number of

Table 1. Sociodemographic Characteristics of Physicians Included in the Study

	Number	%
Age (Mean ± SD)		29,7±3,5
Gender		
Female	137	51,9
Male	127	48,1
Marital Status		
Married	134	50,8
Single	130	49,2
Branch		
Internal	201	76,1
Surgical	63	23,9
The status of keeping sentry		
Yes	193	73,1
No	71	26,9
Assistantship duration (Mean ± SD)		2,6±1,2
The number of keeping sentry (Mean ± SD)		6,9±2,9

Table 2. Anxiety Emotions of Physicians about COVID-19 Infection

	Number	%
Do you think that what being lived related to COVID -19 influenced your spiritual health negatively?		
Yes	214	81,1
No	27	10,2
Undecided	23	8,7
Are you afraid of getting infected by COVID -19?		
Yes	222	84,1
No	25	9,5
Undecided	17	6,4
Are you afraid of transmitting COVID -19 infection to any of your relatives or any of the people around you?		
Yes	260	98,5
No	4	1,5
Did you regret that you chose the medical profession after the COVID -19 pandemic?		
Yes	46	17,4
No	170	64,4
Undecided	48	18,2
Do you think about leaving the assistantship after the COVID -19 pandemic?		
Yes	11	4,2
No	236	89,4
Undecided	17	6,4
Have you lived difficulty in caring for your children, if any present, due to the COVID-19 pandemic?		
Yes	71	32,9
No	121	56,0

keeping sentry was found to be 6.9 ± 2,9.

The median of assistantship duration of all physicians was shown to be 2.6 ± 1.2 years (Table 1).

Among the participants, no history of traveling abroad has been found in the past month. However, 22 of the physicians (8.3%) had close contact with someone who had traveled abroad in the past month. Thirty-two (12,1%) physicians stated that they had a relative or an acquaintance who was diagnosed with COVID-19. Besides, 227 (86,0%) of those mentioned that they

Table 3. The Status of Anxiety and Depression Scores of Physicians According to Various Variables

	Anxiety Score		Depression Score	
	Median (IQR)	p	Median (IQR)	p
Gender*				
Female	54,0 (48,0-61,0)	<0,001	14,0 (8,0-22,0)	<0,001
Male	47,0 (41,0-53,0)		10,0 (4,0-18,0)	
Marital status*				
Married	50,0 (44,0-57,0)	0,298	12,0 (4,0-19,0)	0,116
Single	51,0 (45,0-60,0)		13,0 (7,0-21,0)	
Branch*				
Internal	51,0 (44,0-57,09)	0,476	12,0 (5,0-19,0)	0,364
Surgical	50,0 (43,0-58,0)		14,0 (7,0-22,0)	
Status of keeping sentry*				
Yes	50,0 (45,0-57,0)	0,996	12,0 (6,0-19,0)	0,901
No	52,0 (43,0-58,0)		13,0 (5,0-22,0)	
Negative influence on spiritual health **				
Yes	53,0 (47,0-60,0)[a]	<0,001	13,0 (7,0-20,0)[a]	0,004
No	36,0 (32,0-41,0)[a]		3,0 (1,0-19,0)[a]	
Undecided	46,0 (41,0-51,0)[a]		10,0 (4,0-14,0)[b]	
The fear of getting infected by COVID-19**				
Yes	52,0 (47,0-59,0)[a]	<0,001	12,5 (6,0-20,0)	0,552
No	41,0 (32,0-47,0)[a]		11,0 (3,0-19,0)	
Undecided	44,0 (39,0-52,0)[b]		14,0 (3,0-24,0)	
The fear of transmitting COVID -19 infection to any of their relatives *				
Yes	50,0 (44,0-57,5)	0,027	12,0 (6,0-20,0)	0,838
No	39,0 (31,5-46,0)		10,0 (3,5-23,5)	
Regret about choosing the medical profession after the COVID-19 pandemic **				
Yes	61,0 (50,0-65,0)[a]	<0,001	18,0 (13,0-24,0)[a]	<0,001
No	47,5 (41,0-53,0)[a,b]		10,0 (4,0-18,0)[a]	
Undecided	56,0 (50,0-59,5)[b]		13,5 (6,5-19,5)[b]	
Thoughts about leaving the assistantship after the COVID -19				
Yes	66,0 (60,0-76,0)[a]	<0,001	21,0 (15,0-36,0)[a]	0,002
No	50,0 (43,0-56,0)[a,b]		11,5 (5,0-19,0)[a]	
Undecided	57,0 (54,0-63,0)[b]		18,0 (12,0-20,0)[b]	

*Mann-Whitney U test, **Kruskal- Wallis Test IQR=Interquartile range, [a,b] Groups where differences emerged

did not have and 5 (1,9%) mentioned that they were not sure. Two hundred fourteen physicians (81.1%) think that COVID-19 infection influenced them spiritually. Two hundred and twenty-two (84.1%) participants were afraid of getting an infection because of being a healthcare worker, while 260 (98.5%) of transmitting the infection to their relatives or environment. Forty-six (17.4%) of the physicians stated that they regretted choosing the medical profession after the COVID-19 epidemic. In comparison, 11 (4.2%) physicians had thoughts to leave the assistantship (Table 2).

Women's anxiety and depression scores were significantly higher than the men's scores (p <0.001). A significant association was found between the negative influence on spiritual health and the anxiety score. We, however, observed that this consequence was caused by the difference between all groups (p <0.001,
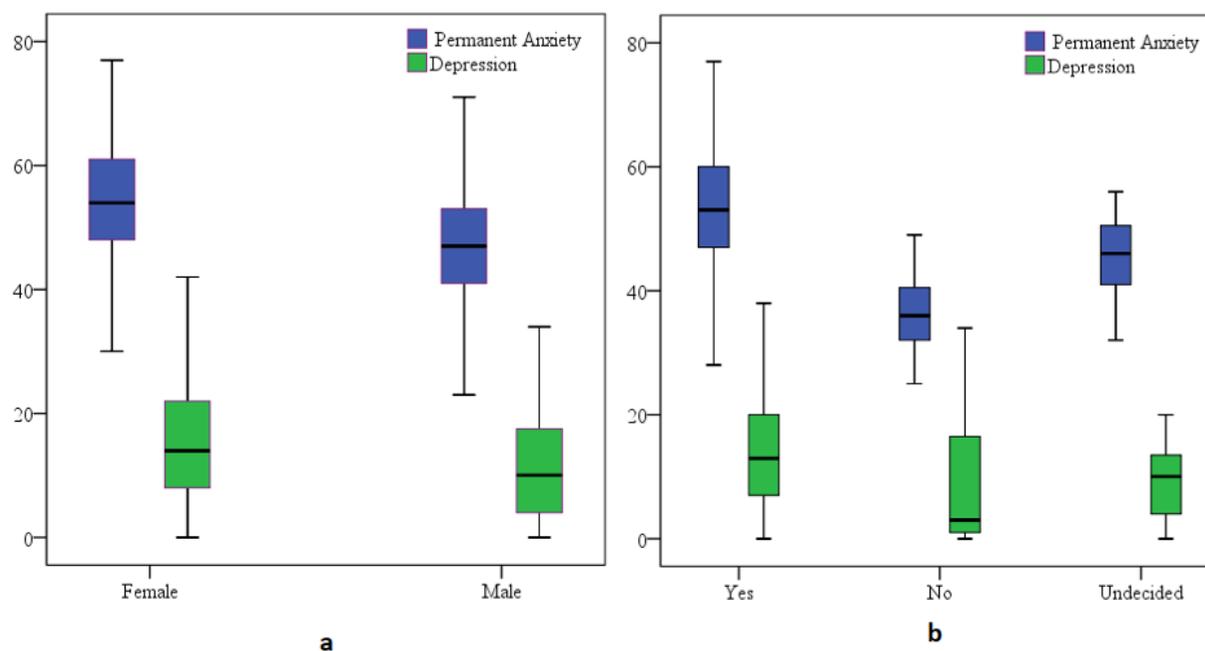
Figure 1. The association of anxiety and depression with gender (a) and, with the negatively influenced spiritual health by COVID-19 infection (b)
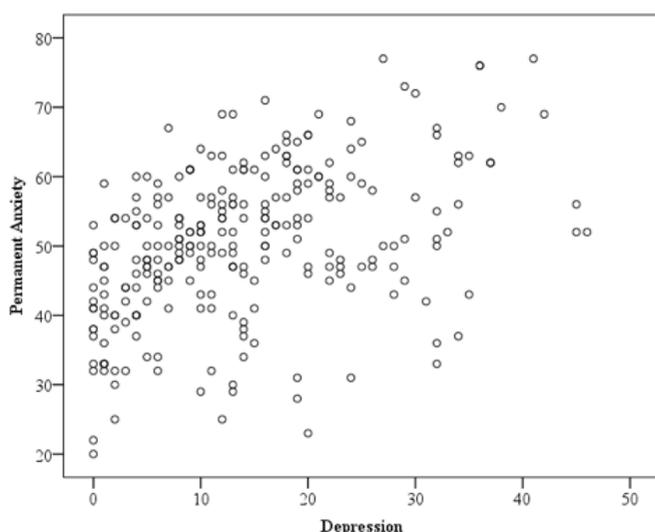

Figure 2. Correlation of Anxiety Score and Depression Score

Figure 1a).

The association between negative influence on spiritual health and the depression score was also significant. It has resulted from the difference between the two groups, those who said ''yes'' and ''no'' (p=0,004, Figure 1b).

As seen in Table 3, a significant association also was shown between the fear of getting infected by COVID-19 and anxiety score (p <0.001). This difference emerged between the groups of those who said ''yes'' and ''no''. The anxiety score of those who were afraid of transmitting COVID-19 infection to any of their relatives was defined to be significantly higher than those who were not afraid (p = 0.027). We observed a remarkable positive correlation of anxiety and depression with regret about choosing the medical profession after the COVID-19

pandemic. For anxiety score, this difference appeared between the groups of those who said ''no'' and ''undecided'' and those of ''no'' and ''yes''. Besides, for the depression score, it was observed between only the groups of those who said ''yes'' and ''no''. The association of the anxiety and the depression with thoughts of leaving the assistantship after the COVID-19 was determined to be statistically significant (p<0,001, p=0,002). For anxiety score, this statistical significance, resulted from the difference between the groups of those who said ''no'' and ''undecided'' and those ''no'' and ''yes''. In comparison, for depression score, it was caused by the difference between only the groups those who said ''yes'' and ''no''. No significant correlation was found between marital status, branch, and status of keeping sentry and anxiety and depression (p>0,05).

According to multiple linear regression analysis, the statistically significant association was found between gender (β=-4,973, p<0,001), regret about choosing the medical profession (β=-2,155, p0,042), the negative influence on spiritual health (β=-5,108, p<0,001) and anxiety. We observed that women and those with negatively influenced spiritual health and those who regretted, have tended to have more anxiety. According to that analysis again, a significant correlation was determined, between gender (β=-4,415, p=0,001), the negative influence on spiritual health (β=-2,281, p=0,027), and depression as well. Consequently, it was found that women and those with negatively influenced spiritual health tended to be more depressed.

No significant association was established between anxiety and depression and assistantship duration and the number of keeping sentry (p> 0.05). According to the correlation analysis performed between anxiety score and depression score, a significant association at medium-level in a positive way was determined (r = 0.443, p <0.001) (Figure 2).

Discussion

When looking at the literature, there is no study assessing anxiety and depression levels in association with COVID-19 of health workers in Turkey, especially physicians.The spiritual health of 81.1% of physicians has been negatively influenced due to the COVID-19 pandemic in our study. Physicians' regret for choosing the profession of medicine was detected to be 17.4%. In contrast, those who were undecided about this item were indicated to be 18.2%. After the COVID-19 epidemic, healthcare workers have been faced situations such as the high risk of infection, overwork, dealing with patients with negative emotions, and moving away from their own families. This situation has caused mental health problems such as anxiety, depression, stress, and fear in healthcare professionals [4, 10]. In our study, a large proportion of physicians (84.1%) were found to be afraid of getting infected with COVID-19 and transmitting the infection to any of their relatives (98.5%). One of the most important causes of the anxiety in healthcare workers is the risk of becoming infected by the disease and then transmitting that disease to their families and relatives [10].

In this study, no significant relationship was established between marital status and anxiety and depression levels. However, anxiety and depression levels of female physicians were significantly higher than male physicians. In the study performed on COVID-19 cases in Wuhan city of China, no significant correlation was found between the gender and marital status of the participants and their anxiety and depression levels [11]. A study conducted towards society in China detected no significant association between gender and anxiety [12]. Whereas the change of anxiety levels according to gender may be different in some studies, a meta-analysis study reported women to have higher anxiety levels than men [13]. In another study carried out for medical specialty students, depression of female physicians was stated to be significantly higher than men [14]. In the study on Turkish society, an online questionnaire was applied to 343 people from 18 different cities. Similar to the results of our study, there was no relationship between marital status and anxiety and depression score. Besides, both women's anxiety scores and depression scores were found to be significantly higher than men [15]. In a study on healthcare workers in Iran, no significant relationship was determined between marital status and anxiety and depression. While women's anxiety was significantly higher than men's, no significant difference was established for depression [16].

In this study, no significant relationship was found between age and anxiety and depression levels. Kong et al. declared anxiety and depression levels of those in a higher age group to be significantly higher than those in the low age group [11]. In the study performed by Huang and Zhao, depression and anxiety of those in a low age group were higher than those in a high age group [12]. In the research on physicians in Oman, there was no significant association between age and anxiety, similar to our survey [17]. The absence of a significant difference in our study may be caused by the distribution of the workload regarding COVID-19 among all assistant physicians regardless of the age difference.

In this study conducted with physicians, a significant association at medium-level in a positive way was demonstrated between participants' anxiety levels and depression levels. This situation may be associated with anxiety and depression that trigger each other. In another study with COVID-19 patients, again, a significant correlation at a medium-level in a positive way was found between depression and anxiety levels of patients [11].

There are some limitations in our research. First, this study is designed cross-sectionally in an epidemiological meaning, which makes it difficult for us to make a causal inference. Secondly, as the study was done as single-centered, the problem of generalization was faced. Thirdly, for obeying the social distance rule, we performed our study online, not directly under observation. This status may have also caused a low participation rate.

Conclusion

In conclusion, due to COVID-19 infection, physicians have had some concerns, and their spiritual health has been influenced negatively. Along with the fear of getting infected, they have been much more afraid of transmitting the infection to their relatives. In order to eliminate or at least reduce anxiety, physicians must be protected strictly. Various effective measures may, therefore, be taken. As an example, we should take a lesson from the acute respiratory syndrome (SARS) outbreak [10], and help destroy fears by establishing triage tents, especially outside the hospital.

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